



Baltimore Aircoil Company

February 3, 2003

Mr. G. William Pennington
Chief Energy Efficiency Program Specialist
California Energy Commission
1516 9th Street, MS 28
Sacramento, CA 95814-5512

**Subject: Title 24 Requirements for Third Party Performance Certification of
Evaporative Heat Rejection Equipment**

Dear Mr. Pennington,

I am pleased with your decision to include the requirement for CTI Certification in the next draft of the 2005 Standards. I am convinced that the impact of this decision will be more significant for the energy grid in California than anyone may ever suspect.

One aspect of the draft which I would recommend you reconsider is the exclusion of the CTI certification requirement for towers below 100 tons in capacity. Although I agree that the majority of the benefit derived from the requirement for CTI Certification will be associated with systems of 100 tons and larger, I do not see why the requirement shouldn't be extended down to even the smallest systems. Below is an excerpt of our response to Mark Hydeman which clarifies our thinking on this issue:

We do not see any advantage to establishing a capacity threshold below which CTI certification will not be required. We feel this way for four (4) reasons:

(1) It could be argued that CTI certification provides the most benefit for the owner of a smaller cooling tower because the cost of hiring an independent testing agency to verify the performance of the tower in the field will be prohibitively high relative to purchased equipment price. It is highly unlikely that any effort will be expended to verify the performance of smaller systems in the absence of a CTI certification requirement.

(2) There is no cost benefit to the manufacturer by establishing a minimum threshold. The cost to a manufacturer to certify a given product line will be the same whether the certification extends to the smallest capacity models of the product line or not.

(3) The establishment of a minimum threshold can give rise to the application of multiple, small capacity, uncertified towers on larger capacity systems to circumvent the requirement for CTI certification. This will obviously be contrary to the intent of the requirement for CTI certification but will be possible nonetheless.

(4) The enforcement of Title 24 requirements with respect to evaporative heat rejection equipment will be much more complicated for California Building Inspectors if a minimum capacity threshold is applied. Without a minimum capacity threshold, enforcement is simple... a cooling tower either has a CTI Label or it isn't Title 24 compliant. With a threshold, units without CTI Labels may still be compliant, which will require further investigation in order to verify.

The only other issue associated with the draft which I will suggest be considered would be the inclusion of efficiency standards for closed circuit cooling towers along with a provision requiring CTI certification for these products. Although there are not as many closed circuit towers sold per year, as are open towers (approximately one closed circuit tower for five open circuit towers), the number is still very significant. Because closed circuit towers incorporate one additional step of heat transfer versus open towers, they consume more energy from a GPM/HP standpoint, making the establishment of realistic efficiency standards for them even more important.

Since 2000, CTI STD-201 has had an active certification program for closed circuit cooling towers. All of BAC's closed circuit cooling towers product lines are now certified per CTI STD-201. Although owners and engineers prefer to specify CTI certified closed circuit cooling towers, non-certified products are still widely applied in this segment due to the limited number of competitors who participate in it (primarily just BAC and Evapco). As is the case with open cooling towers, a closed circuit cooling tower which is not truly delivering the capacity for which it is rated will deliver higher cooling water temperatures than expected at a given ambient wet bulb which will cause significant energy penalties to be borne by the compressorised equipment (e.g. chillers and heat pumps) from which it is rejecting heat. It is our opinion that the only cost effective way for the CEC to insure that closed circuit cooling towers will deliver the performance and capacity claimed by their manufacturer is to include them in Table 112-H of the 2005 Standards along with a provision for certification.

An example of what Table 112-H might look like with the inclusion of closed circuit cooling towers is attached for your reference. The areas which we have modified are highlighted in blue. The rating condition of 95/85/75 was chosen to be consistent with that of the open towers in the table. The performance criteria of 20.0 gpm/hp for propeller/axial fan and 10.0 gpm/hp for centrifugal fan closed circuit cooling towers was chosen to be consistent with the majority of models of closed circuit cooling towers currently offered for sale in North America by the major manufacturers.

I plan to follow up with you in the near future to hear your thoughts on these issues. In the meantime please feel free to call me at (410) 799-6454 if you have any questions.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'James Furlong', is written over a light blue rectangular background.

James Furlong
Vice President of Sales

Copy to:

B. Alcorn, California Energy Commission
B. Meister, California Energy Commission
D. Mills, California Energy Commission
M. Stanga, Competition Advocates

TABLE 112-H PERFORMANCE REQUIREMENTS FOR HEAT REJECTION EQUIPMENT

Equipment Type	Total System Heat Rejection Capacity at Rated Conditions	Subcategory or Rating Condition	Performance Required ^{a,b}	Test Procedure ^c
Propeller or Axial Fan Open Cooling Towers	All	95°F Entering Water 85°F Leaving Water 75 °F wb Outdoor Air	≥ 38.2 gpm/hp	CTI ATC-105 and CTI STD-201
Centrifugal Fan Open Cooling Towers	All	95°F Entering Water 85°F Leaving Water 75 °F wb Outdoor Air	≥ 20.0 gpm/hp	CTI ATC-105 and CTI STD-201
Propeller or Axial Fan Closed Circuit Cooling Towers	All	95°F Entering Water 85°F Leaving Water 75 °F wb Outdoor Air	≥ 20.0 gpm/hp	CTI ATC-105 and CTI STD-201
Centrifugal Fan Closed Circuit Cooling Towers	All	95°F Entering Water 85°F Leaving Water 75 °F wb Outdoor Air	≥ 10.0 gpm/hp	CTI ATC-105 and CTI STD-201
Air Cooled Condensers	All	125°F Condensing Temperature R22 Test Fluid 190°F Entering Gas Temperature 15°F Subcooling 95°F Entering Drybulb	≥ 176,000 Btu/h-hp	ARI 460

^a For purposes of this table, cooling tower performance is defined as the maximum flow rating of the tower divided by the fan nameplate rated motor power.

^b For purposes of this table air-cooled condenser performance is defined as the heat rejected from the refrigerant divided by the fan nameplate rated motor power.

^c Cooling Towers shall use the test procedures in CTI ATC-105. Cooling Towers which are 100 tons or larger shall be certified as specified in CTI STD-201. The existing language gives an unfair advantage to competing products when one of the products has a certification program in existence and the other does not. For example, there are small cooling towers that compete with air-cooled equipment. The cooling towers have an optional certification program, but no program exists for competing air-cooled equipment. The current language would force the added burden of certification onto all cooling towers, whereas no added burden would be placed on air-cooled equipment. The proposed language addresses this issue for cooling towers by requiring them to meet the same requirements as air-cooled equipment..